Obesity and the Built Environment:

Improving Public Health Through Community Design

• May 24-26, 2004 • Marriott Wardman Park Hotel, Washington, DC •

National Institute of Environmental Health Sciences, National Institutes of Health

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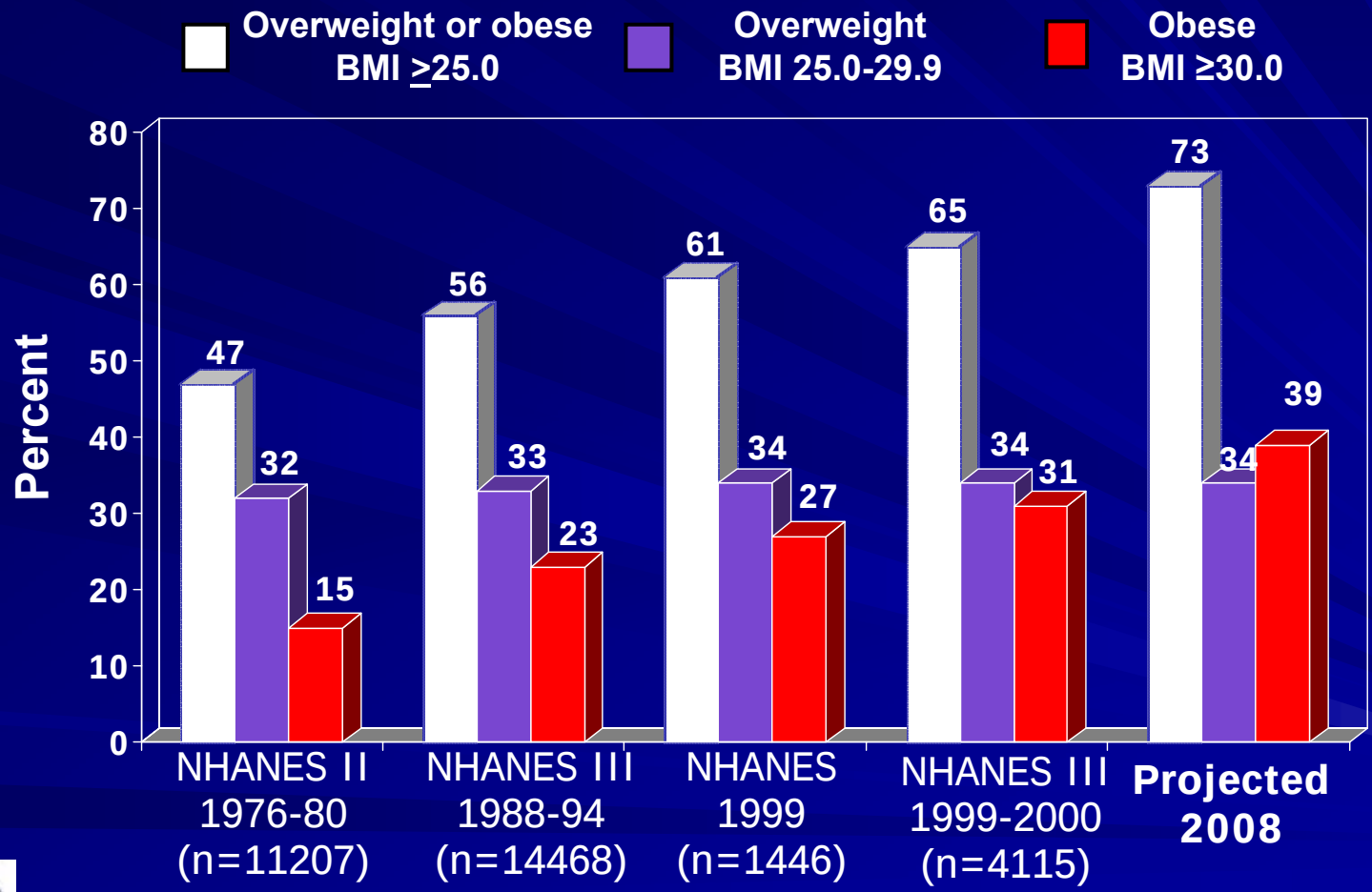
SYNTHESIS AND DISCUSSION

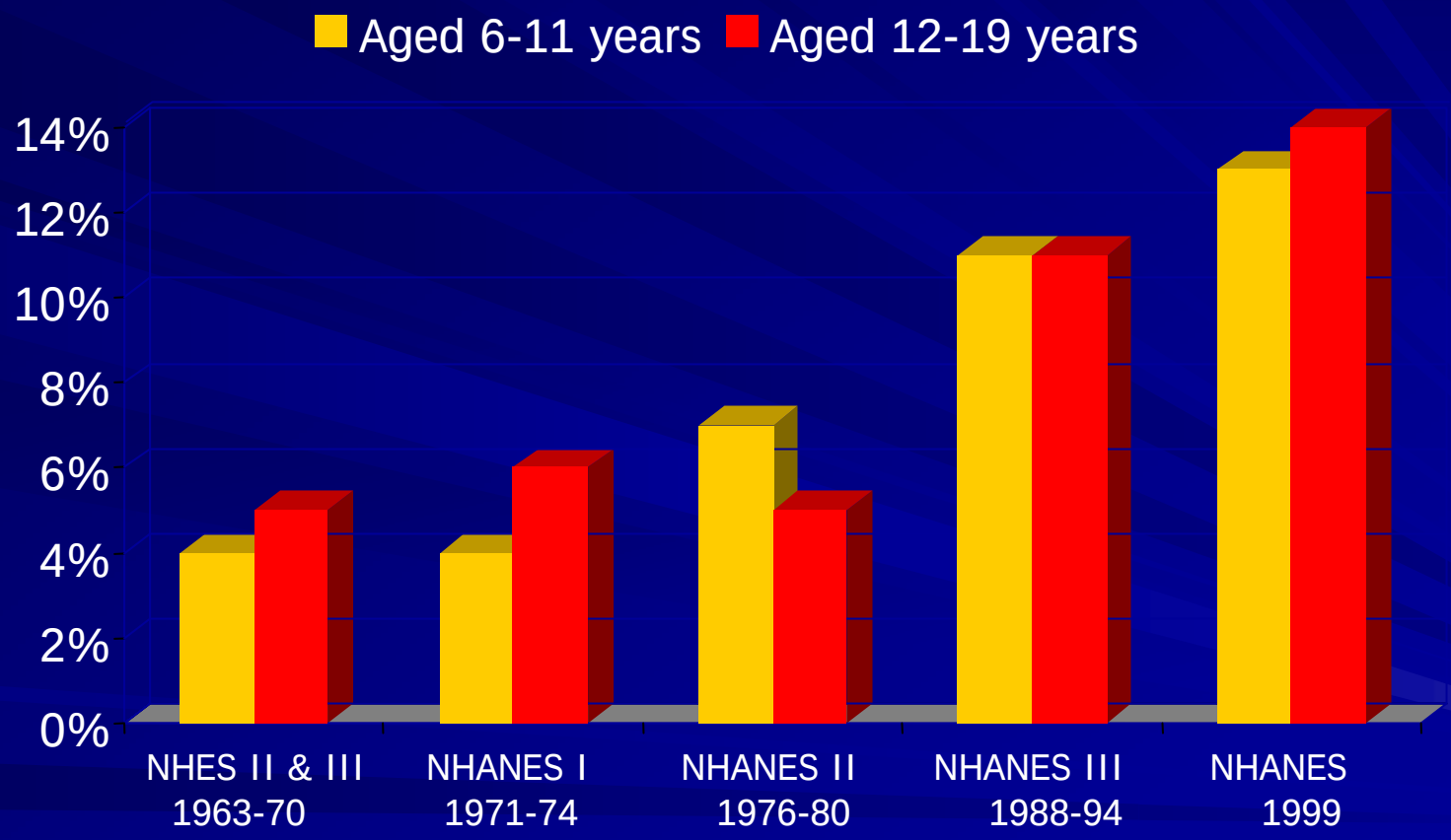
Prevalence of Overweight and Obesity Among US Adults, Age 20-74 Years*



BMI = body mass index.

*Age-adjusted by the direct method to the year 2000 U.S. Bureau of the Census estimates using the age groups 20-34, 35-44, 45-54, 55-64, and 65-74 years.

Prevalence of Overweight Among US Children and Adolescents



Source: Centers for Disease Control and Prevention , National Center for Health Statistics, National Health and Nutrition Examination Survey

KEY ENVIRONMENTAL FACTORS (1)

- Intensive marketing of unhealthy foods
- Passive leisure time activities
- Overabundance of highly processed foods including fast food meals, snack foods, soda, and bakery goods
- Neighborhood design that discourages walking, biking, and active play
- Safety concerns that keep children indoors
- Community institutions that reinforce dominant cultural norms regarding nutrition and activity (schools, faith-based institutions, after-school programs, etc.)

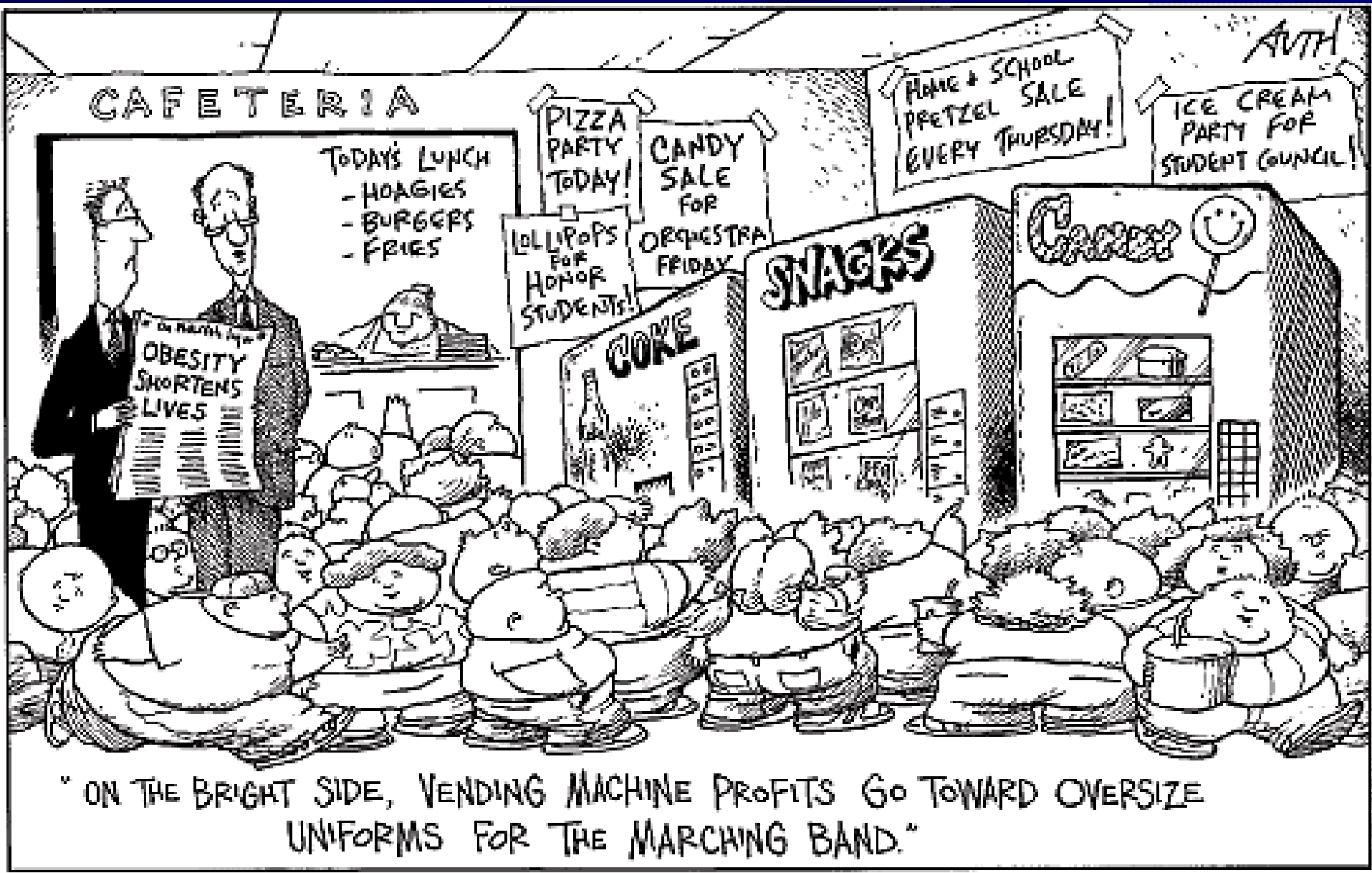
KEY ENVIRONMENTAL FACTORS (2)

- Social norms:
  - Junk/fast food tastes best
  - Technology-based activities including computers, videos, Gameboys, movies, and television are the coolest, most fun
  - Pressures contributing to a fast-paced, on-the-run lifestyle
  - Reductionistic view of good nutrition -- as long as you get vitamins, minerals, and fiber you don't need to eat real food
  - Fear of fat -- makes people vulnerable to consuming processed foods including diet sodas, shakes, power bars, etc.
- Government programs (WIC, surplus foods) that are responsive to food producers but often do not supply clients with foods that are in line with the dietary guidelines
- Lack of full service supermarkets and other healthy retail food outlets

Surgeon General's Call to Action

- To prevent and decrease overweight and obesity, 2001.
- In contrast to many public health goals, obesity rates have steadily increased.
- If not reversed, this generation may be the first not to outlive their parents.
- Obesity is difficult to treat. Prevention is critical.
- Multidimensional communication, action, research, and evaluation.
  - Individual, family, community, and public policy levels.
  - "Environmental factors…provide the greatest opportunity for actions and interventions designed for prevention and treatment."
  - "Behavior change can occur only in a supportive environment with accessible and affordable healthy food choices and opportunities for regular physical activity."

The New American Way?

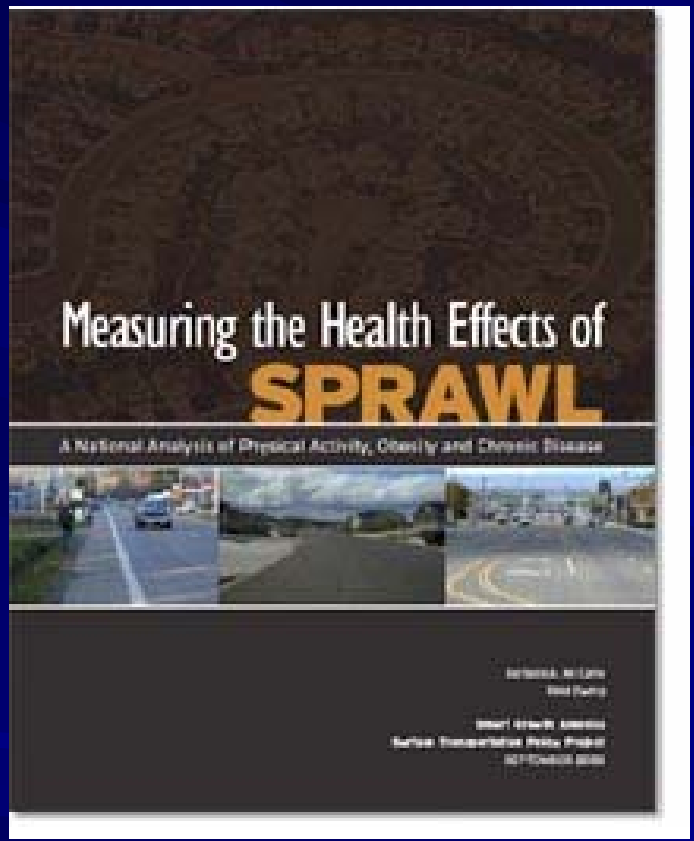


Individual and Community Responsibility

- Obesity arises in large part from private behavior: consumption – activity.
- Environmental exposures promote consumption and discourage activity.
  - Food availability, advertising, pricing.
  - Neighborhood design.
- Local communities have a role.
  - Safe places to play and exercise.
  - School locations, lunches, and physical education programs.
  - Zoning, planning, and architectural regulations.
  - Modes of transportation.

EVIDENCE TO DATE

Environment-Physical Activity



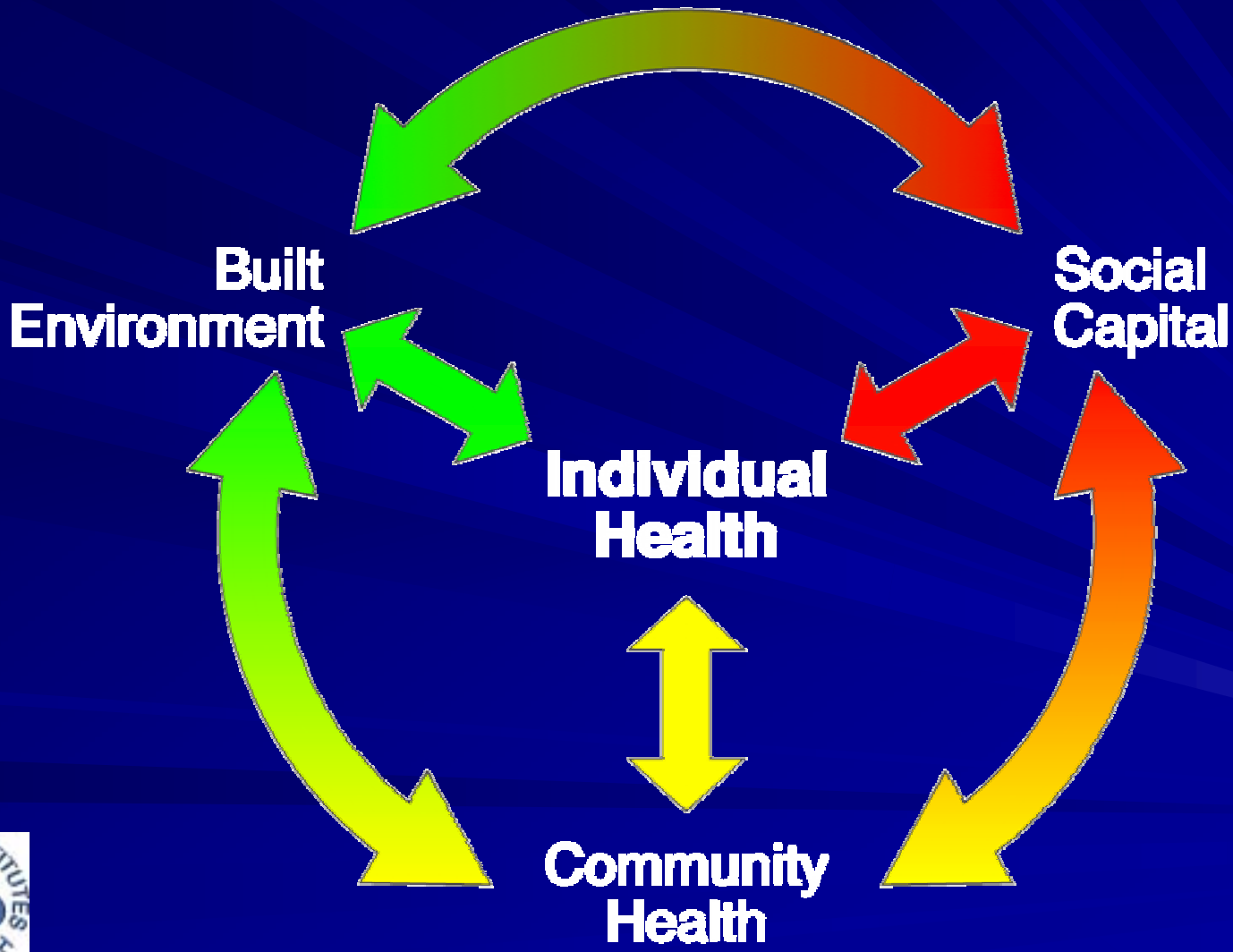
- Lower BMI found in compact, mixed use, interconnected counties of the nation.
- Reduction in obesity when environments are more compact, mixed use, and interconnected.
- Increased access to recreational resources is associated with a reduced prevalence of obesity.
- Walking and biking are higher in compact neighborhoods, lower in suburban neighborhoods.

EVIDENCE TO DATE

Environment-Nutrition

- Reduced prices for healthy foods increase sales of those foods.
- Food labeling produces a decrease in caloric intake and fat consumption.
- Lowest-cost diets are composed of starches, added sugars, and added fats.
- “Healthier” diets cost more.

Interdependent Determinants



INTERVENTIONS

- Point-of-decision prompts increase stair use by 54% in a variety of settings including train, subway, and bus stations, shopping malls, and university libraries and in a variety of population subgroups including men and women, both obese and not obese.
- Community-wide campaigns with messages directed to large audiences through different types of media result in a 5% increase in the proportion of people who are physically active in both rural and urban communities and among different ethnic and socioeconomic groups. Also strengthen social networks and improve cohesion and collective ability to bring about change.
- Social support interventions in community settings result in a 44% increase in time spent being physically active and a 20% increase in the frequency of physical activity. Also improve fitness levels, lower body fat, increase knowledge about exercise, and improve confidence in ability to exercise.
- Improving access to places for physical activity results in a 25% increase in the percent of persons who exercise at least 3 times a week.

Source: CDC Guide to Community Preventive Services

Environmental Influences in Pathogenesis of Atherosclerosis

- Environment-nutrition
  - Aljada et al. Am. J. Clin. Nutr. 79: 682-690, 2004.
  - High-fat fast-food breakfast produces inflammatory factors and ROS.
  - May contribute to chronic pro-inflammatory and pro-oxidative states seen in hypertension.
- Environment-nutrition-physical activity intervention
  - Woo et al. Circulation 109: 1981-1986, 2004.
  - Measured endothelium-dependent dilation in overweight 9-12 year olds.
  - Diet + exercise improved endothelial function at 6 weeks and 1 year.

HYPOTHESES/QUESTIONS

- Does increased PA enhance academic achievement or worksite productivity as measured by standardized tests in schools, work absenteeism, health care costs?
- Larger distances btwn kids' homes and schools impedes PA and increases obesity.
- Study cost effectiveness, e.g., Does changing vending machines to healthier choices enhance revenue? What economic benefits accrue to communities that design new green space?
- Assess policy change, e.g., Do changes in zoning lower BMI?
- How does school env act as catalyst or barrier to PA?
- How does BE influence behavior? Causal pathways?
- How can workplaces enhance PA?
- Examine variation in the quality of food environments in high and low walkability and high and low SES communities.
- What kinds of community design are best for getting children and adolescents outside to exercise?
  - Backyards, front yards, streets, parks, community centers, etc.?
  - Differences by age and gender?

INDICATORS/MEASURES

- Multi-level analyses: individual, interpersonal, family, community, society.
- Develop common instruments.
- Health: BMI; school/work records; insurance rates; other?
- Food/nutrition: amounts, choices, access, supermarket data, school vending machines & products.
- PA: accelerometers, driving time, VMT, TV time, exercise time, GIS, GPS.
- “Walkability:” sidewalks, transit modes, aesthetics, safety, green space, trails.
- Regulations/policies that affect BE; enforcement.

DESIGNS

- Prospective.
- Qualitative & quantitative, incl cost effectiveness.
- Match different approaches to what we know about population groups.
- Combine educational & environmental approaches, at multiple levels.
- Focused assessments on youth, elderly, and across gender and ethnicity.
- Interdisciplinary, incl communities.
- Identify model programs.
- Utilize natural expts and case studies.

CONCLUSIONS

- If we can't imagine what the future looks like, we cannot get there from here.
- Time of opportunity – but make connections.
- It will take us all working together to create the future environment we want.

Breakout Session I – State of the Science

Tuesday, May 25, 10:00 – 11:30 AM

1. What is the current state-of-the science for potentially modifiable environmental factors associated with obesity among children and adults?

2. For a given environmental or behavioral factor, what has changed over the last 40 years to explain the increase in overweight/obesity?

3. Does a given environmental or behavioral factor play a similar role across age, sex, ethnic, and socioeconomic groups?

Breakout Session II – Setting the Research Agenda

Tuesday, May 25, 3:30 – 5:00 PM

- What specific hypotheses can be advanced to examine how the built environment has contributed to obesity? What study designs would be appropriate to address these hypotheses?
- Are there existing valid indicators, on both individual and population levels, to assess how the built environment influences obesity? If so, what are these measures? How and where have they been applied? If not, what steps are needed to develop appropriate markers?
- What are the best approaches to identifying modifiable environmental determinants?

Breakout Session III – Developing Intervention Strategies

Wednesday, May 26, 10:00 – 11:30 AM

1. What specific hypotheses can be advanced to examine the effectiveness of built environment interventions in reducing the extent of obesity? What study designs would be appropriate to address these hypotheses?

2. What are the current strategies (either research or policy) to address environmental determinants of obesity? Have these strategies been effective? If not, what is needed to guide more successful strategies?

3. What remains to be determined to develop rational and effective prevention efforts to decrease obesity?

Built and Social Environments

Built Environment

- Buildings, spaces, and products created, or at least significantly modified, by people.
- Land Use (industrial or residential)
- Buildings (housing, schools, workplaces)
- Public Resources (parks, museums)
- Zoning Regulations
- Transportation Systems

Social Capital

- Sense of community
  - Membership
  - Influence
  - Integration and fulfillment of needs
  - Shared emotional connection
- Civil society
  - Socialization
  - Public and quasi-public functions
  - Fostering democratic debate